CLAIMS

What is claimed is:

1. 1. In a system including an application having a plurality of components, at least one

2. component having a property, each property being identified with an identifier, a method of

3. associating an element of a user-interface to a current state of a property, the method comprising:

4. associating the element of the user-interface with a property path, the property path

5. including a concatenation of a plurality of identifiers, the concatenation of identifiers defining a

6. path through the components of the application to a property at the end of the concatenation; and

7. mapping the property path to a current state of the property at the end of the path defined

8. by the concatenation of identifiers, to associate the element of the user-interface with the current

9. state of that property.

1. 2. The method of claim 1 wherein the step of mapping the property path further comprises:

2. a) examining each identifier in the concatenation of the property path in succession;

3. b) determining, for the first identifier in the concatenation of the property path, a second

4. state of a property with a name identical to the first identifier, a component of the application

5. containing that property becoming a root application component;

6. c) identifying, for the first identifier, a component of the application to which the second

7. state points as a current application component;

8. d) mapping the first identifier to the second state;

9. e) determining for the next identifier in the concatenation of the property path, a next

10. state of a property with a name identical to the next identifier located within the current

11. application component;

12   f) identifying, for the next identifier, a component of the application to which the next

13   state points as a current application component;

14   g) mapping the next identifier to the next state; and

15   h) repeating steps e, f and g until the last identifier of the concatenation is examined to

16   map the property path to the current state of the property with a name identical to the last

17   identifier.

1   3.   The method of claim 1 wherein the step of mapping the property path to the current state

2   further comprises mapping the property path to an undefined state if no property is found that

3   corresponds to an identifier in the plurality of identifiers in the concatenation.

1   4.   The method of claim 1 wherein the step of mapping further comprises generating a node

2   tree having a plurality of nodes, wherein each node of the node tree represents a mapping of an

3   identifier to one of, a state of a property and an undefined state.

4   5.   The method of claim 4 wherein the node tree represents a plurality of property paths.

5   6.   The method of claim 1 further comprising monitoring a plurality of states within the

6   application to detect a change in one of the states of the plurality of states, each state in the

7   plurality corresponding to one of the states mapped to an identifier in the concatenation of the

8   property path.

1   7.   The method of claim 6 wherein the step of monitoring further comprises receiving a

2   property change event from a JAVABEAN-compatible component.

1   8.   The method of claim 6 further comprising re-mapping the property path to a new current

2   state in response to detecting the change in one of the states of the plurality of states.

1   9.   The method of claim 6 further comprising re-mapping the identifier the concatenation of

2   identifiers to the changed state in response to detecting the change in one of the states of the

3   plurality of states.

1   10.   The method of claim 1 further comprising generating a property change message in

2   response to a change in a state of a property corresponding to one of the identifiers in the

3   concatenation of the property path.

1   11.   The method of claim 1 further comprising updating one or more user-interface elements

2   associated with the property path with a new current state in response to a change in the current

3   state of the property.

1   12.   The method of claim 1 wherein the step of re-mapping the property path further

2   comprises:

3   a) detecting a change in one of a plurality of states in an application, each state in the

4   plurality corresponding to one of the states mapped to an identifier in the concatenation of the

5   property path,

6   b) examining each identifier in the concatenation of the property path in succession,

7   starting with an identifier corresponding to the changed one of the states of the plurality of states;

8   c) determining for a currently examined identifier, a new next state of a property with a

9   name identical to the currently examined identifier;

10   d) re-mapping the currently examined identifier to the new next state in response to a

11   change in a currently mapped state; and

12   e) repeating steps c and d for each subsequent identifier in the concatenation of

13   identifiers.

1   13.   The method of claim 12 wherein the step of repeating for each subsequent identifier

2   further comprises terminating the repeating in response to the new next state being identical to a

3   state currently mapped for that currently examined identifier.

1   14.   The method of claim 12 further comprising monitoring a new plurality of states within

2   the application, the new plurality including the new next states mapped to an identifier in the

3   concatenation of the property path.

1   15.   The method of claim 1 wherein the property path is a first property path and the

2   concatenation of identifiers includes a wildcard identifier and further comprising:

3   mapping a second property path to a first value; and

4   determining a second value for the wildcard identifier in response to the first value

5   mapped to the second property path.

1   16.   The method of claim 15 wherein the step of determining the second value further

2   comprises determining the second value such that replacing the wildcard identifier of the first

3   property path with the second value causes the current state mapped to the first property path

4   with the replaced wildcard identifier to be equal to the value mapped to the second property path.

1   17.   The method of claim 1 further comprising dynamically binding the property path to one

2   of the application components including the property corresponding to the current state mapped

3   to that property path.

1   18.   The method of claim 1 further comprising transmitting to the application a request to

2   update the current state of the property mapped to the property path associated with the element

3   of the user-interface in response to a user modification of the value.

1   19.   The method of claim 18 further comprising inhibiting a property change message in

2   response to the application updating the current state of the property in response to the request to

3   update.

1   20.   The method of claim 1 wherein the user interface comprises an exemplary element

2   associated with a property path including a wildcard identifier, the wildcard identifier

3   corresponding to an indexed property including an index value range from a minimum value to a

4   maximum value, further comprising:

5   generating an additional element for each index value of the indexed property from the

6   minimum value to the maximum value by copying the given element associated with the property

7   path; and

8   associating a new property path with each additional element.

1   21.   The method of claim 20 further comprising replacing the wildcard identifier associated

2   with the given element with the corresponding index value of the additional element to define the

3   new property path.

4   22.   The method of claim 1 further comprising registering interest in the property path.

5   23.   The method of claim 1 wherein the step of mapping further comprises mapping one of the

6   identifiers in the concatenation of the property path to a state of a property corresponding to the

7   one of the identifiers.

1   24.   A system for associating an element of a user-interface to a current state of a property of

2   an application, the application having a plurality of components, at least one component having a

3   property, each property being identified with an identifier, the system comprising:

4   a property connector module to identify an association between the element of the user-

5   interface and a property path, the property path including a concatenation of a plurality of

6   identifiers, the concatenation of identifiers defining a path through the components of the

7   application to a property at the end of the concatenation, and to map the property path to a current

8   state of the property at the end of the path defined by the concatenation of identifiers, thereby

9   associating the element of the user-interface with the current state of that property.

1   25.   The system of claim 24 wherein the property connector module is further configured to:

2   a) examine each identifier in the concatenation of the property path in succession;

3   b) determine, for the first identifier in the concatenation of the property path, a second

4   state of a property with a name identical to the first identifier, a component of the application

5   containing that property becoming a root application component;

6   c) identify, for the first identifier, a component of the application to which the second

7   state points as a current application component;

8   d) map the first identifier to the second state;

9   e) determine, for the next identifier in the concatenation of the property path, a next state

10   of a property with a name identical to the next identifier located within the current application

11   component;

12   f) identify, for the next identifier, a component of the application to which the next state

13   points as a current application component;

14   g) map the next identifier to the next state; and

15   h) repeat steps e, f and g until the last identifier of the concatenation is examined to map

16   the property path to the current state of the property with a name identical to the last identifier.

1   26.   The system of claim 24 wherein the property connector module is further configured to

2   map the property path to the current state further comprises mapping the property path to an

3   undefined state if no property is found that corresponds to an identifier in the plurality of

4   identifiers in the concatenation.

1   27.   The system of claim 24 wherein the property connector module is further configured to

2   generate a node tree having a plurality of nodes, wherein each node of the node tree represents a

3   mapping of an identifier to one of, a state of a property and an undefined state.

4   28.   The system of claim 27 wherein the node tree represents a plurality of property paths.

5   29.   The system of claim 24 wherein the property connector module is further configured to

6   monitor a plurality of states within the application to detect a change in one of the states of the

7   plurality of states, each state in the plurality corresponding to one of the states mapped to an

8   identifier in the concatenation of the property path.

1   30.   The system of claim 29 wherein the property connector module is further configured to

2   receive a property change event from a JAVABEAN-compatible component.

1   31.   The system of claim 29 wherein the property connector module is further configured to

2   re-map the property path to a new current state in response to detecting the change in one of the

3   states of the plurality of states.

1   32.   The system of claim 29 wherein the property connector module is further configured to

2   re-map the identifier the concatenation of identifiers to the changed state in response to detecting

3   the change in one of the states of the plurality of states.

1   33.   The system of claim 24 wherein the property connector module is further configured to

2   generate a property change message in response to a change in a state of a property corresponding

3   to one of the identifiers in the concatenation of the property path.

1   34.   The system of claim 24 wherein the property connector module is further configured to

2   update one or more user-interface elements associated with the property path with a new current

3   state in response to a change in the current state of the property.

1   35.   The system of claim 24 wherein the property connector module is further configured to:

2   a) detect a change in one of a plurality of states in an application, each state in the

3   plurality corresponding to one of the states mapped to an identifier in the concatenation of the

4   property path,

5   b) examine each identifier in the concatenation of the property path in succession,

6   starting with an identifier corresponding to the changed one of the states of the plurality of states;

7   c) determine for a currently examined identifier, a new next state of a property with a

8   name identical to the currently examined identifier;

9   d) re-map the currently examined identifier to the new next state in response to a change

10   in a currently mapped state; and

11   e) repeat steps c and d for each subsequent identifier in the concatenation of identifiers.

1   36.   The system of claim 35 wherein the property connector module is further configured to

2   terminate the repeating in response to the new next state being identical to a state currently

3   mapped for that currently examined identifier.

1 37. The system of claim 35 wherein the property connector module is further configured to

2 monitor a new plurality of states within the application, the new plurality including the new next

3 states mapped to an identifier in the concatenation of the property path.

1 38. The system of claim 24 wherein the property path is a first property path and the

2 concatenation of identifiers includes a wildcard identifier and the property connector module is

3 further configured to:

4 map a second property path to a first value; and

5 determine a second value for the wildcard identifier in response to the first value mapped

6 to the second property path.

1 39. The system of claim 38 wherein the property connector module is further configured to

2 determine the second value such that replacing the wildcard identifier of the first property path

3 with the second value causes the current state mapped to the first property path with the replaced

4 wildcard identifier to be equal to the value mapped to the second property path.

1 40. The system of claim 24 wherein the property connector module is further configured to

2 dynamically bind the property path to one of the application components including the property

3 corresponding to the current state mapped to that property path.

1 41. The system of claim 24 wherein the property connector module is further configured to

2 transmit to the application a request to update the current state of the property mapped to the

3 property path associated with the element of the user-interface in response to a user modification

4 of the value.

1   42.   The system of claim 41 wherein the property connector module is further configured to

2   inhibit a property change message in response to the application updating the current state of the

3   property in response to the request to update.

1   43.   The system of claim 24 wherein the user interface comprises an exemplary element

2   associated with a property path including a wildcard identifier, the wildcard identifier

3   corresponding to an indexed property including an index value range from a minimum value to a

4   maximum value, and the property connector module is further configured to:

5   generate an additional element for each index value of the indexed property from the

6   minimum value to the maximum value by copying the given element associated with the property

7   path; and

8   associate a new property path with each additional element.

1   44.   The system of claim 43 wherein the property connector module is further configured to

2   replace the wildcard identifier associated with the given element with the corresponding index

3   value of the additional element to define the new property path.

4   45.   The system of claim 24 wherein the property connector module is further configured to

5   register interest in the property path.

6   46.   The system of claim 24 wherein the property connector module is further configured to

7   map one of the identifiers in the concatenation of the property path to a state of a property

8   corresponding to the one of the identifiers.

1   47.   The system of claim 24 further comprising:

2   a client node including:

3   the user interface having one or more elements; and

4   a client portion of the property connector module.

1 48. The system of claim 24 further comprising:

2   a server node including:

3   the application; and

4   a server portion of the property connector module.